The manufacturing sector can be considered as one of the most important sectors of the Indian economy, both in terms of its expansion on to the economy and its contribution to income generation, employment creation and foreign exchange earnings. In context of the prevailing theory of modern economic development, industry is considered as an “engine of development” and expected to play major role in mitigating disparities among different regions (Kaldor 1967). Manufacturing industries with their sophisticated techniques and high level of productivity were seen to be a source of both swiftly rising living standards and national prestige in the developed countries (Myrdal 1968). It is widely held that manufacturing industries with the limited infrastructural requirement promised a much more rapid growth in productivity and capital accommodation. The promises of the future development clearly lies in the execution of the manufacturing sector, as agricultural sector is no longer in a position to pay a sizeable boost to the economy of the state, it is only the manufacturing sector, which holds the potential to provide the growth and absorb the unemployed and underemployed population. Under such conditions, it is important to analyse the growth of the manufacturing sector to determine the future course of action for the development of the state.

The most common pattern of the structural changes follows the sequences of the shift from agriculture to industry and then to service sector. The structural change takes place in the economy as the process of economic development proceeds further and gathers momentum. In India, the structure of production has been shifted towards the machine tools, electrical and non-electrical equipments and machinery and transport equipment industries since 1957. The low-income elasticity of demand for agriculture products tends to shift this pattern of production in favor of manufacturing of having a high-income elasticity of demand (Fisher 1939). Food, clothing and wood products gave way to chemical, metal products and modern manufacturing products, which provided the necessary momentum to the growth of the secondary sector. The developed countries have shown a definite pattern of diversification by product structure from primary processing industries in the manufacturing of consumer
durables and then to the manufacturing of capital goods or from light industries to heavy industries.

The last decade following the liberalization through deregulation of the economy saw a radical shift in the state of manufacturing sector in India and the sector is making a significant contribution to the gross domestic product, employment, capital investment and export. Due to deregulation policies of the Center, the industries earlier strengthened in a protected and subsidized environment have been suddenly opened to face multinational companies. The era of deregulation associated with globalization, liberalization and privatization has made the Indian companies to develop core competencies in terms of technologies and managing the dynamism and the opportunities that come by over the years. The mode of globalization was expedited in India through deregulation policy mechanism and this was done with the conviction that globalization or deregulation would help to witness higher economic growth and thus contributed towards generating employment opportunities by being biased to labour-intensive growth. The favorable effects of the integration of the domestic economy to world economy probably did take place in the form of increased economic growth, but it has materialized with a lag and was limited to some specific sectors of the economy (www.ihindia.org).

After having the full-fledged Statehood on 25 April 1971, the State made intense efforts on infrastructural development of the industries and industrial belts were setup at Parwanoo, Baddi, Barotiwala, Bilaspur, Shamshi, Nagrota, Bagwan, Mehatpur and Chambaghat. In Himachal Pradesh, the economic growth is mostly contributed by the agriculture and allied occupation and Industrialization is comparatively recent phenomena in the State. The process of Industrialization in the State was mainly held back by the harsh climatic conditions, topographical and geographical challenges. In such a sequence of the events, the advantages in the form of inducement and subsidies as well as the development of convenient infrastructure resources become the main gear to captivate the industrial investment in the State. Although the process of industrialization in the State has not been able to open the throttle as compared to the bordering states, e.g. Punjab, Haryana, U.P, and Uttrakhand, yet with enhancement of the economic overhead cost, the state has been able to lessen the location and geographical loopholes to an ample degree. The industrial sector in the state has come up with varied industries as rural and traditional
handlooms and handicrafts, cottage, micro and small scale industrial units as well as
the high-tech textile, telecommunication equipments, sophisticated electronic units,
pharmaceuticals, engineering, high-quality precision tools, food processing industries
(www.himachal.nic.in).

At present, celebrated business houses have invested in varied projects of
agro-processing units, engineering, pharmaceuticals, textiles, information technology
and electronic goods. The sole prominence of the State Government is also laid on
providing peaceful and pro-business atmosphere, transparent and easily accessible
administration, decent power at reasonable tariff, well developed infrastructure such
roads, inland container depot, proposed supply of piped natural gas and compressed
natural gas for industrial, domestic, commercial and transport sectors, creation of
trade centre, common effluent treatment plant etc. (www.himachal.nic.in). This will
definitely give a boost to industrialization in the state. The performance of the sectors
such as handlooms, handicrafts, sericulture, mining and geology, store purchase and
other labour intensive areas have been of tremendous effects because of the
development of these sectors, the benefits of industrialization will also spread to the
rural population of the State.

The percentage of organized manufacturing sector in total gross state domestic
product of Himachal Pradesh increased from 3.01 percent to 7.32 percent in between
1980-81 and 1990-91 and 15.02 percent during 2000-01, but tapered off up to 13.64
percent in the year 2008-09 (MOSPI). The portion of agriculture sector in total gross
state domestic products declined by 44.21 percentages to 35.51 percent during the
pre-reform period and further slipped to 23.41 percent and 18.99 percent in the year
during 2000-01 and the year 2008-09 respectively. The state economy is moving
towards secondary and tertiary sectors, which are contributing 39.24 and 41.07
percent to state gross domestic products respectively. The Present study is an attempt
to assess the performance of the organized manufacturing sector in Himachal Pradesh
in the backdrop of deregulation policy reform of the 1990s.

Objectives of the study

The study is based on the following objectives:

1. To examine the composition of the organized manufacturing sector of
   Himachal Pradesh and the changes occurring during the pre-reform period and
during the deregulation period (1991-92 to 2012-13).
2. To analyse the trend growth rate of output and inputs of the organized manufacturing sector of the state during the pre-reform period and during the deregulation period (1991-92 to 2012-13).

3. To analyse the trend growth rates of capital productivity, labour productivity and capital intensity in the organized manufacturing sector during the pre reform period and during the deregulation period.

4. To examine the total factor productivity growth of the organized manufacturing sector of Himachal Pradesh during the pre-reform period and the deregulation period.

5. To explore determinants of the employment and productivity in the organised manufacturing sector and selected industries during the pre-reform period and during the deregulation period.

6. **Data Source, Time Period and Methodology**

The last thirty years have witnessed a huge amount of empirical research on the performance of the manufacturing sector in India and various States of both aggregate as well as disaggregate levels. In order to empirically test the above mentioned objectives, the study focuses on the organized manufacturing sector of the Himachal Pradesh. The discussions on the review of literature show that the studies on the manufacturing sector are mostly done at national level and there is a dearth of studies at the regional as well as disaggregate level. Besides that, the state level studies are done in industrially developed states of Gujarat, Maharashtra, Tamil Nadu, Punjab etc. A few scholars have studied the manufacturing sector of Himachal Pradesh in their national level studies, but their analysis is not very comprehensive with respect to Himachal Pradesh. The present study could not come across any case study on the manufacturing sector of Himachal Pradesh at inter-temporal and inter-industry level.

of the manufacturing sector and used disaggregated data up to two or three digit level National Industrial Classification (NIC) of the various states and in India as a whole.

Variables defined

The value of output: is the aggregate market value of products manufactured for sale, work done for customers and sale value of goods sold in the same condition as purchased and adjusts for the difference in stocks of semi-finished goods at the beginning and the end of the survey year.

Labour : (L) the alternative measures of labour input often used are:

1. Man-hour worked
2. Man-days worked
3. Workers
4. Employees

Number of workers: includes all individuals employed directly or through an agency, weather for wage or not and engaged in any manufacturing process or in cleaning any part of the machinery or premises used for manufacturing process or in any other kind of work incidental to or connected with the manufacturing process or the subject of the manufacturing process.

Number of employees: include persons receiving wages and holding clerical or supervisory or managerial positions engaged in the administrative office, store keeping section and welfare section, sales department as also those engaged in purchase of raw materials etc. or purchase of fixed assets for the factory as well as watch and ward staff.

Total person employed: include the employees as defined above and all working proprietors and their family members who are actively engaged in the work of the factory even without any pay, and the unpaid members of the co-operative societies who worked in or for the factory in any direct and productive capacity.

As obviously the size of man-hour worked as also that of man-days worked will vary accordingly to the definitions. The choice, therefore, would ultimately lie between the workers and employees. Total person employed is taken as the measurement of employment. As both workers, working proprietors and supervisory/managerial staff can affect productivity. Besides, the number of workers
and number of employees are also takes separately for better assessment of their role in the manufacturing sector of the state.

Gross value added: the nominal value of gross value added is calculated by adding the depreciation value of net value added as provided by ASI.

Emoluments: the total emoluments primarily constitute wages to workers, provident fund and other benefits and so on. To estimate the real emoluments the nominal value as provided by the Annual Survey of Industries (ASI) has been converted into real value through the use of relevant price deflators.

Factories: the total number of units (enterprises) in organized manufacturing sectors as reported by the ASI is taken as the number of factories units.

Capital Stock (K): In the absence of a universally applicable methodology, the estimation of capital stock often poses a problem in this type of studies. We have here followed a version of the perpetual inventory accumulation method. This method is based on estimating the capital stock in a particular year by accumulating the additions made to the capital stock in each of the previous years and adding this sum of current year’s additions to capital. It has the following steps:

(a) The initial (base) year’s capital stock has been obtained by doubling the fixed capital figures as provided in the annual survey of industries. This is denoted by $K_0$.

(b) For each year, the addition to gross capital stock has been computed by subtracting the fixed capital of the preceding year from the fixed capital of the current year. Each year depreciation allowance has been added to it to arrive at an estimate of net addition to capital stock thus:

$$\text{Net addition to capital stock in year } t - 1 = \frac{FC_t - FC_{t-1} + D_t}{WPIC_t} \times 100$$

Where $FC_t = \text{Fixed capital in year } t$

$FC_{t-1} = \text{Fixed capital in year } t-1$

$D_t = \text{Depreciation in year } t$

$WPIC_t = \text{Wholesale Price index of capital and machinery in year } t \text{ with base 2011-12} = 100.$
For year t, the estimate of capital stock (K) is obtained by using the following equation.

\[ K_t = K_0 + (l_t - 0.02 K_{t-1}). \]

The present study analyses the growth and productivity performance of the organized manufacturing sector of Himachal Pradesh during the period from 1980-81 to 2012-13 onwards. The change in the products mix pattern and percentage share of the important variables of selected manufacturing industries over time has been estimated by dividing the variables of the total organized manufacturing sector at the three digit level. Inter-industry as well as intra-industry percentage share has been calculated and their comparison has been made. Besides the organized manufacturing sector, the study also discussed the use-based classification of manufacturing industries such as basic goods, capital goods, intermediate goods; consumer durable goods and consumer non-durable goods industries to track the performance of these industries in line with deregulation of the economy. Accordingly, we have split the 58 three digit manufacturing industries into eight basic goods, eighteen capital goods, twelve intermediate goods, twelve consumer durable goods and eight consumer non-durable goods industries. Trend growth rates have been calculated by using the semi-log linear regression analyses to find out the changes in growth pattern of various inputs and output variables in the entire organized manufacturing sector of Himachal Pradesh and its three digit manufacturing industries. We have National Industrial Classifications (NIC) with different base years (NIC-1970, NIC-1987, NIC-1998, NIC-2004 and NIC-2008). These are concorded by splitting method to get a NIC with base year 1998. The concordance table for the NIC-1970 and NIC-1987 has been taken from MoSPI and the same has been concorded with NIC-1998. After this we have concorded the NIC-2004 with NIC-1998 and same procedures if followed for NIC-2008. At last we are left with table of all manufacturing goods classified under National Industrial Classification (NIC-1998).

Several methods have been suggested to estimate total factor productivity index. The difference in these indices essentially lies in the scheme of assigning weights to the inputs. In most empirical studies, either the Kendrick Index or the Solow Index has been used. In some of the recent studies we observe the use of Translog Index. For the calculation of total factor productivity, we have employed Translog Index Number. We turn to the discussion of these indices now.
Kendrick Index

Let us assume that there is one homogeneous output denoted by $Y$ and there are two factors of production capital denoted by $K$ and labour denoted by $L$. Further, let $w_0$ and $r_0$ denote the factor rewards of labour and capital in the base year of the study. Then the Kendrick index for year $t$ may be written as

$$A_t = \frac{Y_t}{w_0 l_t + r_0 k_t}$$

This formula may be adjusted suitably to take into account more than two factors of production. The Kendrick index may be defined as the ratio of the actual output to the output, which would have resulted from increased inputs in the absence of technological change. While the Kendrick index is easy to calculate and understand, it suffers from an important defect that it is based on a linear production function and therefore fails to allow for the possible diminishing marginal productivity of factors.

Solow Index

This index is based on Cobb Douglas production function under the assumption of constant return to scale, autonomous Hicks neutral technological progress and payment to factors according to marginal product, leading to following equation:

$$\frac{\Delta A}{A} = \frac{\Delta Y}{y} - \left[ (1 - \beta) \frac{\Delta L}{L} + \beta \frac{\Delta K}{K} \right] \quad \text{……….1}$$

Once the computation of $\frac{\Delta A}{A}$ is done for different year with the help of equation (1) the Solow index is obtained using the following identity (taking $A(0)$ as unity)

$$A(t+1) = A_t \left[ 1 + \frac{\Delta A}{A} \right]$$

It may be pointed out here that the Solow index and Cobb – Douglas production function assumes elasticity of substitution to be unity.
Translog Index

Translog Index numbers are symmetric in data of different time periods and also satisfy the factor reversal test approximately. The Translog Index of technological change is based on a Translog production function, characterized by constant returns to scale. It allows for varying elasticity of substitution and does not require the assumption of Hick-neutrality. Translog Index can be calculated as under.

\[
\frac{\Delta V_t}{V_t} = \log V_{t+1} - \log V_t = \Delta \log V_t
\]

\[
\frac{\Delta L_t}{L_t} = \log L_{t+1} - \log L_t = \Delta \log L_t
\]

\[
\frac{\Delta K_t}{K_t} = \log K_{t+1} - \log K_t = \Delta \log K_t
\]

Where \(V\) is a value added, \(L\) - labour employed, \(K\) – capital

\[
\bar{W} = \frac{1}{2} (W_{t+1} + W_t)
\]

Where \(W = \text{Wage} = \frac{\text{Emoluments}}{\text{GrossValueAdded}}\)

\[
\bar{r}_t = (1 - \bar{W}_t),
\]

\[
\bar{r}_t = \frac{1}{2} (\bar{r}_{t+1} + \bar{r}_t)
\]

Now

\[
\frac{\Delta A}{A_t} = \frac{\Delta V_t}{V_t} - \left( \frac{\bar{W}_t}{L_t} \frac{\Delta L_t}{L_t} + \frac{\bar{r}_t}{K_t} \frac{\Delta K_t}{K_t} \right)
\]

Translog Index of total factor productivity

The index for the base year, \(A(0)\) is taken as 1 then the index for subsequent years is computed using the following equation

\[
A_{t+1} = A_t (1 + \frac{\Delta A_t}{A_t}).
\]
The present study makes use of the growth accounting approach for estimation of productivity growth. The Translog Index of Total Factor Productivity (TFP) is a discrete approximation to the Divisia Index of Technical Change. Translog Index Number is symmetric in data of different time periods and also satisfies the factor reversal test approximately. The Translog Index has been used for the total factor productivity estimates presented in the study, as done earlier by Alhuwalia (1991), Rao (1996), Pradhan and Barik (1998) Das (2003), Goldar and Kumari (2003), Goldar (2004), Das and Kalita (2009) Das et. al. (2010), Virmani & Hashim (2011) and Sharma (2012). The ordinary multivariate linear regression technique (Enter method) has been applied to get the determinants of employment and productivity and significant level has been calculated at one percent and five percent level of significance. Statistical package SPSS has been used to get the results.

**Results and Findings**

It is concluded from the above observation that the organized manufacturing sector of Himachal Pradesh contributes less than two percentage share of the output and employment level each, but slightly higher (4.5%) percentage share of the fixed capital to the total organized manufacturing sector of India in the year 2012-13. The percentage share of the selected variables of the organized manufacturing sector of the state in the organized manufacturing sector of India has increased in the post-reform period as compared to the pre-reform period.

The percentage share of the important variables of selected industry groups, out of the organized manufacturing sector of the state provides valuable insights. The percentage share of important variables of the selected industry group, (which is an aggregate of the food and food products, beverages, textile, chemical and chemical products, non-metallic mineral products, basic metal and metal products, fabricated metal and metal products, machine and machine tools, electrical machinery and apparatus, medical and optical instruments and furniture and other manufacturing industries not elsewhere classified), out of the organized manufacturing sector, have registered lower percentage share of selected variables in the post-reform period against the pre-reform period. No doubt, the higher percentage share of fixed capital is accompanied by a higher percentage share of output, gross value added and the number of workers, but share of the number of units, wages, and emoluments witnessed the lower percentage during the study period.
The chemical and chemical products industry emerged as a dominant industry for cornering the higher percentage share of output (33.35%) and value added (52.45%) in the year 1980-81 and has maintained its dominance during the post-reform period, but the industry has lost its supreme position and has slipped to lower ranks during the year 1985-86 to the year 2005-06. Further the industry has revived and has again cornered the dominant share in terms of all selected variables during the post-reform period. The chemical and chemical products industry has been followed by the machine and machine tools (16.85%), the beverage (12.33%), the textile (10.10%) and basic metal and metal products (8.79%) industries in terms of the percentage share of output in the year 1980-81. But the industry has been followed by the manufacturing of beverage (12.32%), the machine and machine tools (11.17%), basic metal and metal products (7.96%) and medical and optical instruments (5.95%) industries in terms of value added during the pre-reform period.

The manufacturing of the machine and machine tools industry emerged as front runner in terms of the percentage share of the number of factory units (25.29%), employment level (25.12%), total emoluments (27.73%) and wages (29.76%) and has been followed by the manufacturing of the chemical and chemical products (20.54%), the beverage (13.92%) and the medical and optical instruments (5.88%) industries in the pre-reform year 1980-81. The manufacturing of the textile industry has cornered the lion’s share of the fixed capital (22.37%), which has been followed by the manufacturing of the machine and machine tools (20.46%), the medical and optical instruments (15.31%), chemical and chemical products (14.25%) and food and food products industries (10.62%) during the pre-reform period. The textile industry maintained its dominance in providing employment (36.77%) and thus maintained its labor-intensive character during the first decade of the reform period (1991-92 to 2000-01), but lost its dominance and was overcome by chemical and chemical products industry after the year 2005-06, which has provided an approximately one-third share of employment and emoluments after the year 2010-11 onwards. The elimination of quantitative and non-quantitative constraints, rationalization of subsidies, relaxing the regularity controls are some of the reasons that helped the industries to register a higher percentage share during the post-reform period.

The percentage share of the output and value added have increased for the manufacturing of the textile, rubber and plastic products, non-metallic mineral
products and the furniture and other manufacturing not elsewhere classified industries, but slumped in the manufacturing of the chemical and chemical products, machinery and machine tools, medical and optical instruments and beverage industries during the pre-reform period. In the manufacturing of the food and food products and the basic metal and metal products industries the share of the output jumped, while the share of value added slumped during the same time period and vice-versa for the fabricated metal and metal products industries.

The percentage share of the output and gross value added increased for the manufacturing of the food and food products, chemical and chemical products, electrical machinery and apparatus, beverage and the rubber and plastic products industries, but slumped in the textile, non-metallic mineral products, medical and optical instruments and furniture and other manufacturing not elsewhere classified (n.e.c) industries during the post-reform period. However, in the manufacturing of the basic metal products, fabricated metal products and machine and machine tools industries, the share of output declined while that of the value added increased during the post-reform period.

The percentage share of the number of factory units, fixed capital, total person employed, number of workers and the number of employees increased in the manufacturing of the textile, rubber and plastic products, fabricated metal and metal products, basic metal and metal products and furniture and other manufacturing not classified industries but the same declined in the manufacturing of the food and food products, beverage, machine tools, chemical and chemical products and medical and optical instruments (except factory units) industries during the pre-reform period.

The percentage share of the fixed capital declined for all selected industries except for the chemical and chemical products and rubber and plastic products industries during the post-reform period. However, the percentage share of the total person employed, the number of workers and the employees increased for the manufacturing of food and food products, the beverage, textile (except the employees which declined after the year 2005-06 for the above mentioned industries), machine and machine tools and the rubber and plastic products industries, but declined for the manufacturing of the fabricated metal and metal products, medical and optical instruments and furniture and other manufacturing not elsewhere classified (n.e.c)
(except in the year 2005-06) and non-metallic mineral products industry (after the year 1995-96) during the post-reform period.

In order to get in-depth analyses of the industries, the use-based classification of the industrial sector analysis has been done. As far as the percentage shares of the use-based classified industries are concerned, the intermediate goods industries occupied the dominant percentage share of employment, output, value addition and emoluments throughout the study period. The consumer non-durable goods industries has retained the second largest percentage share of the output (17.30%) and the value added (14.24%), but the capital goods industries emerged as the second largest resort of the total person employed (25.12%) and the number of employees (25.17%) during the pre-reform period. The percentage share of output, gross value added, total person employed and employees increased for the basic goods, consumer durable goods and intermediate goods industries, but declined in the capital goods and consumer non-durable goods industries during the pre-reform period.

The percentage share of output, value added, total person employed and the number of employees accelerated for the capital goods, intermediate goods and consumer non-durable goods industries, but for the basic goods and consumer durable goods industries the share decelerated during the post-reform period. The percentage share of the number of units increased in the basic goods (21.84% to 24.00%), capital goods (25.29% to 25.78%) and consumer durable goods (8.05% to 19.11%) industries, but decreased in the intermediate goods (27.59% to 21.33%) and consumer non-durable goods (17.24% to 9.78%) industries during the pre-reform period. The percentage shares of all above mentioned variables declined for all use-based industries except the intermediate goods industries (21.33% to 48.88%) during the post-reform period. The percentage share of fixed capital increased for the basic goods (9.03% to 23.61%) and intermediate goods (37.54 to 37.99%) industries, but decreased in capital goods (20.46 to 16.50%), consumer durable (15.95% to 11.89%) and consumer non-durable goods (17.02% to 3.47%) industries during the pre-reform period. However, the share declined for the basic goods (32.59% to 17.47%), capital goods (16.50% to 7.78%) and consumer durable goods (11.89% to 6.96%) industries, but increased in the intermediate goods (37.99% to 56.20%) and consumer non-durable goods (1.03% to 11.60%) industries during the post-reform period.
In order to get in-depth analyses of the industries, an intra-industry analysis has been done. The intra-industry analyses of manufacturing industries did not provide a clear-cut picture. In food and food products industry, the production, processing, preservation of meat, fish, fruit, vegetable, oils and fats industry (NIC-151) and manufacture of other food products industry (NIC-154), the manufacture of spinning, weaving, and finishing of the textile industry (NIC-171), the manufacturing of other chemical products industry (NIC-242) and the basic iron and steel industry (NIC-271), have maintained their dominance in providing employment throughout the study period.

In machine and machine tool industry, the manufacturing of special purpose machinery industry (NIC-292) maintained their dominance in providing employment and emoluments up to the year 1985-86, but in the consecutive years the dominance shifted to the manufacturing of general purpose machine industry (NIC-291) up to the year 2005-06 and after that, the manufacturing of domestic appliance not elsewhere classified industry (NIC-293) emerged as a dominant industry in providing employment and emoluments. The manufacturing of general purpose machine industry (NIC-291) produced a major share of output and value addition, but the manufacturing of domestic appliance not elsewhere classified industry (NIC-293) emerged as the dominant industry in producing output and providing employment, emoluments and value addition after the year 2010-11.

The fabricated metal and metal products industry has been conspicuous by its absences during the pre-reform period and the manufacturing of other fabricated metal products metalworking service activities industry (NIC-289) was the only established industry in the year 1985-86. But the percentage share of output and value added, employment and emoluments in the manufacturing of structural metal products, tanks, reservoirs and steam generator industry (NIC-281), is higher than that of manufacturing of other fabricated metal products metal working service activities industry (NIC-289) during the first decade of the reform period and vice-versa during the second decade of reform period.

In electrical machinery and apparatus industry, the manufacturing of accumulator, primary cells and primary battery industry (NIC-314) is the only industry in this sub-group during the year 1980-81, whereas the manufacturing of other electrical equipment not elsewhere classified (n.e.c) industry (NIC-319) and
manufacturing of insulated wire and cable industry (NIC-313) were only two working industries in the year 1985-86. The manufacturing of insulated wire and cable industry (NIC-313) became the dominant industry in providing employment during the first decade of the reform period. The manufacturing of electrical motors, generators, and transformer industry (NIC-311) maintained its dominance in providing employment, but on emoluments front, it could not emerge as a major industry during the second decade of reform period. As far as a percentage share of emoluments is concerned, the percentage share of emolument changed frequently among the intra-electrical industry.

The growth rate of selected variables in the organized manufacturing sector and selected manufacturing industries at inter as well as intra industry level have been subjected to greater inter-temporal variation during the study period. The growth rates of the output, gross value added and fixed capital were all time high in the organized manufacturing sector, capital goods and intermediate goods industries (except fixed capital) during the pre-reform period vis-a-vis all other sub periods. Further, the highest growth rates of the output, gross value added, fixed capital, total person employed and employees have been witnessed by the textile industry and has been followed by the non-metallic mineral products, rubber and plastic products (except gross value added), fabricated metal and metal products, basic goods and consumer-durable goods industries during the pre-reform period as compared to all other sub-periods.

The organized manufacturing sector, chemical and chemical products, intermediate goods and consumer non-durable goods industries have exhibited a higher growth rate of the value added as compared to the output during the post-reform period. Further, the food and food products and rubber and plastic products industries realized higher growth rate of the value added vis-a-vis output during the study period. It implies that the sector is either fetching higher prices for their manufactured products or might get success in the reduction of the cost of production during the post-reform period. It might be possible to charge higher prices in the pre-reform period, but due to the onslaught of multinational companies, the chances of the charging higher prices seem less possible during the post-reform period. Hence it might be possible that above mentioned industries might get success in reduction of the cost of production.
Higher growth rates of the total emoluments and wages as compared to the growth rate of the employment level were witnessed in the organized manufacturing sector; all selected manufacturing industries (except the fabricated metal and metal products industry during the first decade) as well as all use-based industries during the study period. It implies that the existing workforce was paid higher wages and perks rather than creating new employment opportunities.

The growth rate of employment has fallen far behind the growth rate of the output, value added and fixed capital for the food and food products, non-metallic mineral products, basic metal and metal products, fabricated metal and metal products and the furniture and other manufacturing not elsewhere classified (n.e.c), electrical machinery and apparatus, beverage, rubber and plastic products and medical and optical instruments industries during the all sub-periods. Beside this, the growth rate of employment was much lower than the growth rate of the above mentioned variables in the textile, chemical and chemical products, machine and machine tools industries (except during the first decade for fixed capital), during the study period. It is a serious cause of concern in the labour abundant economy of Himachal Pradesh.

As per expectation, the declined growth rates of the number of factory units, fixed capital, the total person employed, the number of workers and the number of employees resulted in the decelerated growth rate of the output and value added for the organized manufacturing sector, non-metallic mineral products, basic metal and metal products, fabricated metal and metal products, electrical machinery and apparatus industry, medical and optical instruments and furniture and other manufacturing not elsewhere classified industry, basic goods, consumer durables goods, manufacture of basic chemicals industry (NIC-241), manufacture of general-purpose machinery industry (NIC-291), manufacture of other non-metallic mineral products not elsewhere classified (NIC-269) and manufacture of insulated wire and cable (NIC-313) industries during the first decade of reform period as compared to the pre reform period.

In contrast, the accelerated growth rates of the number of units, fixed capital, the total person employed and the number of employees have miserably failed to achieve accelerated growth rate of the output and the value added for the food and food products, the beverage, the rubber and plastic products industries, production, processing, preservation of meat, fish, fruit, vegetable oil, and fats (NIC-151) and
manufacture of other chemical products industries (NIC-242) during the first decade of reform period vis-a-vis the pre-reform period.

The growth rate of the number of units and the fixed capital has increased but the decelerated growth rate of the employment level ultimately brought declined growth rate of the output and value added in the textile, intermediate goods, manufacturing of special purpose machinery (NIC-292) and the manufacturing of other textile products industries (NIC-172), but successfully accelerated the output as well as the value added for the manufacturing of the chemical and chemical products, manufacturing of other food products (except value added of NIC-154) industries during the first decade of deregulatory policies process as compared to the pre-reform period. In the manufacturing of the machine and machine tools and the manufacturing of other textile products (NIC-172) industries, there was an acceleration of the growth rate of the number of factory units. But the decelerated growth rates of factor inputs (both capital and employment level) resulted in the declined growth rate of the output as well as the value added during the first decade of the reform period.

A higher dose of deregulation policies during the second decade of reform period have also shown very interesting results. There was an acceleration of the growth rates of the number of units, fixed capital, total person employed and the number of employees, which have resulted in the accelerated growth rate of the output and value added for the organized manufacturing sector, machine and machine tools, electrical machinery, furniture and other manufacturing not elsewhere classified, basic metal and metal products, fabricated metal and metal products and medical and optical instruments, basic goods, consumer durable goods, manufacturing of basic chemicals (NIC-241), manufacturing of insulated wire and cable (NIC-313), manufacturing of general-purpose machinery (NIC-291), manufacturing of special purpose machinery (NIC-292) and manufacturing of other non-metallic mineral products not elsewhere classified (NIC-269) industries during the second decade of reform period. But declined growth rate of fixed capital has brought an accelerated growth rate of the output and value added in the organized manufacturing sector, intermediate goods, the manufacturing of general-purpose machinery (NIC-291) and manufacturing of other non-metallic mineral products not elsewhere classified (NIC-269) industries during the second decade of reform period vis-a-vis the first decade of the reform period.
In the food and food products and manufacturing of other textile products (NIC-172) industries, the declined growth rate of the number of units has been accompanied by increased growth rates of the fixed capital, the total person employed and the number of employees, but the growth rates of the output and value added have declined during the second decade of the reform period. The chemical and chemical products, non-metallic mineral products, capital goods, consumer non-durable goods, manufacturing of other chemical products (NIC-242) and the manufacturing of other food products (NIC-154) industries have realized increased growth rates of the number of factory units, the total person employed and the number of employees, but there was declined growth of the fixed capital, which brought deceleration of the growth rate of the output and value added during the second decade of reform period.

The organized manufacturing sector, food and food products, fabricated metal and metal products, textile, electrical machinery and apparatus, basic goods, intermediate goods and consumer durable goods industries witnessed a deceleration of the growth rate of the labour productivity. The labour productivity was determined by either capital productivity or capital intensity. The declining growth rate of labour productivity is determined by the declined growth rate of the capital productivity, although the accelerated growth rate of the capital intensity tried to raise the growth rate of labour productivity during the first decade of the reform period as compared to the pre-reform period. The present analyses reflects that despite the improvement in capital intensity, the productivity of the fixed capital declined substantially during the first decade of the reform period, indicating the persistence of under-utilization of capital stock or failure to sustain an optimum level of capital-output ratio, during the first decade of deregulation period.

In the machine and machine tools and furniture and other manufacturing not elsewhere classified industries, the growth rate of the labour productivity deteriorated due to the declined growth rate of both the capital productivity and capital intensity during the first decade of the deregulation polices process as compared to the pre-reform period. In the medical and optical instruments and basic metal and metal products industries, although there was accelerated growth rate of the capital productivity and capital intensity (except basic metal and metal products industry) yet it failed to accelerate the growth rate of the labour productivity during the first decade of reform period vis-a-vis the pre-reform period. The chemical and chemical
products, rubber and plastic products and the beverage industries witnessed accelerated growth rate of the labour productivity due to the dominant role of improved growth rate of the capital intensity and declined growth rate of capital productivity failed to pull down the growth rate of the labour productivity during the first decade of the reform period.

There was declined growth rate of the labour productivity due to the decelerated growth rate of both the capital productivity and capital intensity in the food and food products industry during the second decade of reform period vis-a-vis the first decade of the reform period. In the chemical and chemical products, textile and beverage industries the decelerated growth rate of the capital intensity has ultimately brought deceleration of the growth rates of labour productivity. However, the improved growth rates of the capital productivity was unsuccessful to push up the growth rate of labour productivity during the same time period as mentioned above. The machine and machine tools and the furniture and other manufacturing not elsewhere classified industries witnessed accelerated growth rate of labour productivity due to the improved growth rate of capital productivity, although declined growth rate of capital intensity attempted in vain to pull down the growth rate of labour productivity. In fabricated metal and metal products and basic metal and metal products industries, labour productivity increased due to the improved growth rate of the capital intensity whereas the growth rate of the capital productivity declined during the same time period. In the manufacturing of the medical and optical instruments and electrical machinery and apparatus industries the growth rate of the labour productivity has accelerated even when there was deceleration of the growth rates of capital productivity and capital intensity. Capital intensity increases the productivity of employees or workers through better utilization of labor time as well as through improved skill labour and in turn through demand; it increased the upward pressure on emoluments. Labour productivity in any manufacturing set up can be changed from the combined role of capital deepening and capital productivity (Ghosh 1994). Capital deepening provides per units of labour with more capital and improvement in labour productivity is measured by per unit value addition by per unit labour.
We are aware of limitation of partial productivities, hence, in order to get the clear scenario, total factor productivity analyses has also been done. The trend growth rates of total factor productivity declined in the organized manufacturing sector, basic goods, consumer durable goods, food and food products, beverage, basic metal and products and machine and machine tools industries during the post-reform period as compared to the pre-reform period. The trend growth rates of total factor productivity for production, processing, preservation of meat, fish, fruit, vegetable oil, and fats (NIC-151), manufacturing of other textile products (NIC-172), manufacturing of iron and steel (NIC-271) and manufacturing of insulated wire and cable industries (NIC-313) have declined during the post-reform period as compared to the pre-reform period. There could be several possible inferences. First, the failure of total factor productivity growth to accelerate with deregulation policies is perhaps indicative of harmful lag effects of the previous interventionist regime. Second, since there was a spurt in investment activity in the 1990s in response to economic reforms, there could be an immediate adverse effect due to the gestation lags. Another possible reason is that the discretionary controls on domestic and foreign dimensions of the manufacturing sector are largely responsible for the lower growth rate of total factor productivity.

In contrast, the trend growth rates of total factor productivity for the capital goods, intermediate goods, consumer non-durables goods, chemical and chemical products, medical and optical instruments and the furniture and manufacturing not elsewhere classified, manufacturing of other chemical products (NIC-242), manufacturing of other fabricated metal products, metal working service activities (NIC-289), manufacturing of special purpose machinery (NIC-29) and manufacturing of other electrical equipment not elsewhere classified (n.e.c) industries (NIC-319) accelerated during the post-reform period vis-a-vis the pre-reform period. The trend growth rate of the total factor productivity for the textile industry was negative during both the pre and the post reform period. Deregulation of manufacturing sector since 1991 resulted in significant gains in productivity caused by the market determined more efficient allocation of resources. These measures aim at the relaxation of
restrictions on the entry of private firms and introduced competition both domestically and through import of manufactured goods, capital and technology.

In this part, the determinants of employment and productivity in the organized manufacturing sector and selected industries have been discussed. The choice of variables from such a functional relationship determined is initially on axiomatic consideration. Under this, the variables, fixed capital and output are considered to indicate the growth of the industry. The underlying implication here is that more investment in plant and machinery will open up the opportunity for expansion of employment avenues in the sector, while axiomatically changing levels of fixed capital could be independently viewed as a factor having strong potential to influence the employment level. It is also logical to expect that the effects of capital infusion would also be ultimately reflected in the output level of the sector. The output, fixed capital and technology have positive yet low and insignificant contribution in employment generation in the organized manufacturing sector, basic goods and capital goods (negative) industry during the pre-reform period. The output has contributed positively and significantly to the employment generation in the organized manufacturing sector, basic goods and capital goods industries during the post-reform period. But contrary to our expectation, the fixed capital and technology have reported a negative insignificant coefficient for the organized manufacturing sector, basic goods, capital goods and intermediate goods industries during the post-reform period, which implies the adverse impact of fixed capital and technology on employment generation.

In intermediate goods industries fixed capital played positive and major role in employment generation, but output played negative role during the pre-reform period. In consumer durable goods industry, the output exhibited positive and significant contribution in employment generation during the pre-reform period as well as in the post-reform period. Capital and technology played negative, although insignificant role in the pre-reform period, but fixed capital and technology played a positive and significant role in employment generation during the post-reform period.

In consumer non-durable goods industry, the output, capital and technology exhibited positive, but insignificant impact in employment generation in the pre and
the post-reform period. The output contributed favorably in employment generation in the pre-reform period as well as in the post-reform period for the selected manufacturing industry group. The capital exhibited negative role, but technology played positive minor role in employment generation in the pre-reform period. This scenario reversed in the post-reform period where technology played a negative role while the capital played a favorable role.

It is further concluded here that the new economic policies of deregulation have not created favorable conditions rather created unfavorable situation for employment generation in the organized manufacturing sector, capital goods, intermediate goods, consumer durable and non-durable goods, manufacture of food and food products, beverage, textile, chemical and chemical products, basic metal and metal products, machine and machine tools, medical and optical instruments and furniture and other manufacturing not elsewhere classified industries as the coefficient of multiplicative dummy variables turned to be negative insignificant. In sharp contrast, new economic policies of deregulation created a favorable situation for employment generation for the selected industry group, basic goods, non-metallic mineral products, fabricated metal and metal products and electrical machinery and apparatus industries as the coefficient of multiplicative dummy variables turned to be positive insignificant.

The determination of employment function is initially attempted in terms of basic variables of fixed capital and output. In the similar line of argument, the value added and output of the sector is derived as a function of labour and capital component of productivity. As far as productivity determinants are concerned, the labour productivity reported positive and significant contribution in value added in the pre-reform period, whereas the coefficient turned low and insignificant in the organized manufacturing sector and selected industry group in the post-reform period. Capital productivity contributed adversely in value addition in the pre-reform period, but the contribution turned positive and significant during the post-reform period. The residual technology exhibited positive low and significant in value added for the organized manufacturing sector and selected industry group in both the pre and the
post-reform period. The selected industry group witnessed positive and significant association between value addition and labour productivity during the pre-reform period, whereas the coefficient turned to be insignificant yet positive in the post-reform period. The capital productivity exhibited positive, but statically insignificant contribution in value added for the selected industry group during both the pre and the post-reform period.

It can be concluded here that the labour productivity contributed positively and significantly in value addition for all use-based industries (except consumer non-durable goods) in the pre-reform period as well as the post-reform period. The capital productivity played adverse role in value addition in the pre-reform period, but favorably for basic goods, consumer durable and consumer non-durable goods industries during the post-reform period and vice-versa for capital goods and intermediate goods industries. The technology contributed positively and significantly in value addition for the organized manufacturing sector, intermediate goods industries and selected industry group in the pre-reform period as well as in the post-reform period. Capital productivity played favorable role in value addition for basic goods, capital goods and consumer non-durable goods industries in the post-reform period.

As far as selected manufacturing industries are concerned, the labour productivity contributed positively and significantly in value addition for beverage, chemical and chemical products, non-metallic mineral products, basic metal and metal, machine and machine tools and medical and optical instruments industries in the pre-reform period as well as post-reform period. Labour productivity contributed positive, but insignificant in value addition for electrical machinery and apparatus, food and food products and furniture and other manufacturing not elsewhere classified industries in the pre and the post-reform periods. Textile industry recorded adverse contribution of labour productivity in value added during the pre-reform period; however the contribution turned positive and significant in the post-reform period.

Capital productivity contributed positively, but insignificant in value addition to food and food products, fabricated metal and metal products, electrical machinery
and apparatus and furniture and other manufacturing not elsewhere classified industries in the pre-reform period as well as post-reform period. Capital productivity contributed adversely in value addition in medical and optical instruments and beverage industry in both the pre-and the post-reform period; however the contribution turned negative in the post-reform period for textile, non-metallic mineral products and basic metal and metal products industries. Capital productivity contributed adversely in value added for chemical and chemical products and machine and machine tools industries in the pre-reform period, but during the post-reform period the contribution in value addition became positive.

The new economic policies of deregulation created unfavorable conditions for value added for organized manufacturing sector, selected industry group, capital goods, consumer durable and non-durable goods, beverage, chemical and chemical products, basic metal and metal products, machine and machine tools, electrical machinery and apparatus, medical and optical instruments and furniture and other manufacturing not elsewhere classified industries of Himachal Pradesh. But the new economic policies created favorable conditions for value addition for the basic goods, intermediate goods, food and food products, textile, non-metallic mineral products and fabricated metal and metal products industries and provided relief to these industries.

Policy Implications

In the light of present study the following suggestions and policy implications are offered:

1. Percentage share of the output and employment of the organized manufacturing sector of Himachal Pradesh is less than two percent each, in total organized manufacturing sector of India. It must be increased by establishing large sized labour intensive units, which must have demand of local raw material and must have local demand of finished products. In addition to it, the large sized units of exports quality goods must be established and promoted. Being the labor abundant state, the government should frame policy for the traditional handloom industries which are labour intensive and
the raw stuff is available locally and there is local demand too. The better management of these traditional industries surely can boost the employment opportunities. The restructuring the industrial process and organization is the need of hour. While establishing new units, it must be kept in mind that the new industrial units should be based on local material and local demands, which would create production and expenditure linkage in the state economy. It is relevant to recognize here that Himachal Pradesh cannot be industrialized along conventional lines. Priority should be given for setting up of the ‘sunrise’ industries, which produce skill intensive, high-tech and high value added items. In these industries, the human resource factor is an important input in production relative to physical resources.

2. The Agro-food processing industries are not performing well in the land. Being the fruit basket of India, the state government should frame sound policy to the revive food processing units like manufacturing of apple juice, jams and pickles etc.

3. The furniture industries have less than one percent share of output, employment and value added out of the total organized manufacturing sector of Himachal Parades. As the state is rich in timber and other cutting materials and are capable of the propagation of the utilization, the furniture industry should be considered as an important industry. The state government should take on such policy moves that can prevent its exports to other states and simultaneously establishing home industries.

4. Despite the good performance of chemical and chemical products industries, the increment in employment level is lower than that of the output and value added. The policy makers should give more importance to the generation of the employment opportunities in the industry.

5. The percentage share of output and employment (12% and 20%, respectively) of the capital goods industry, out of organized manufacturing sector of Himachal Parades should be increased. Hence, the state government should set up high tech industries at grass root level which can boost the export.
6. The structure and expansion of superior infrastructural facilities in terms of roads, electricity and telecommunication are of utmost necessity. The state government should invest itself to expand production capacity in the state. This can be possible only by providing high quality infrastructural and basic services. Efficient infrastructure can constitute as a powerful engine of industrial take off. This would ultimately reduce the cost of production which might be reflected in raising the productivity level in subsequent rounds.

7. The state economic system must expand indigenous technological potential and impart technical education and skills to its working class. Further, the firm’s policy and procedures should be applied to persuade the firms to impart technical knowledge of its workers.

8. As the manufacturing sector has recorded less percentage share of output and employment the state should encourage manufacturing sector, which has greater potential to absorb the continuous increasing educated technical labour force. The manufacturing sector should be strengthened with labour-intensive units and the share of this sector should increase in gross domestic product of the state so that the share shed by agricultural sector should be absorbed by this sector.

9. The textile sector should exploit the opportunities available due to he removal of quota system in multi fiber agreement under World Trade Organization regime. The sector should be encouraged to upgrade its technology to compete in the international open markets. No doubt, initially with the improvement in labour productivity, it may go slow in the generation of employment but ultimately it well emerge with large potentials. To put the economy of the state on high growth path, productivity of the manufacturing sector should improve considerably. It will enable the state to function smoothly in national and international competition.

10. The challenges faced by industrial units are manifold and the most important among them is high capital intensity and the low capital productivity. Lower capital productivity can be caused by backward technology and inadequacy of skilled manpower. The technology upgradation for small and tinny units is a
substantive problem which needs immediate solutions. However, exogenous arrangements of technology are not only very costly because of the technological obsolescence but require continuous import of technology too. The cooperative research and development can be a possible choice where the state should play a fundamental role to establish innovation institutions but small units must also contribute and work in close cooperation with the research and development units to solve the technology related problems. The continuous upgradation of technology has the capacity to improve the quality of goods produced in the unorganised industries.

11. There is need to regulate the supply of raw materials and intermediate products which come from other states. This should be on a similar basis as the food procurement policy already adopted by the central government since it ensures control both on the quality of products and the unreasonably spiraling prices.

12. There is acute need for suitable policy formation by state body to establish exclusive industrial park. Besides, suitable institutional and infrastructural prerequisites must be there for the required encouragement to the entrepreneurs. Establishment of industrial park will encourage the young entrepreneurs. The state should come forward to accept the responsibility of a leader for governing the market as has been suggested in Post-Washington consensus and harness growth complementarily of the state and the market. The political will and administrative skill is the key for development of the state.

13. The self-employed workers working in small and tiny units, which do not create enough surpluses either for expansion of enterprises or for decent living, should be given immediate attention by policy makers. On the other hand, the issue of social security needs to be strengthened by the policy makers, because it not only can takes care of the problem of old age, but will also allow the owners of small and tiny units to expand the size of units as well as to think of retiring from active work in old age and also in case of ill health.
14. To enhance the productivity of small industrial units and workers, it would be advisable that workers from the smaller units may be deputed in the large industrial units for acquiring skill and training. Similarly, engineers, technicians of large sized units need to be sent to the small sized units to upgrade skill and expertise of the workers. Besides, workers also need to be sent to the Entrepreneurial Development Institute to improve their skills.

**Limitation and scope of future research**

The present study is based exclusively on the organized manufacturing sector of the Himachal Pradesh and unorganized sector has not been taken into consideration. The study takes into account only the performance of the representative selected industries but other industries were not taken into consideration. For the future research, the growth behavior of the organized manufacturing sector of the state can be analyzed in the light of specific policy reforms and can include all manufacturing industries. The unorganized manufacturing sector of the state can be taken for further research. Linkages between organized manufacturing sector and unorganized manufacturing sector of Himachal Pradesh could be future area of research.